CLAIMS

What is claimed is:

1. A control circuit for a laser diode, the circuit comprising:

a power controller for adjusting a bias current to the laser diode to change the power output of the laser diode, the power change having a corresponding wavelength shift effect on the nominal operating wavelength of the laser diode;

a wavelength controller for compensating for the wavelength shift such that the laser diode maintains operation at the nominal wavelength.

2. The control circuit of Claim 1 wherein the power controller comprises:

a bias current source that provides an adjustable bias current to the laser diode and having a power reference voltage input;

a power monitor loop including a backface diode for monitoring the laser diode power output to provide a power monitor signal;

a power control signal added to the power monitor signal to provide a power adjust signal;

wherein the bias current source adjusts the bias current responsive to a difference between the power reference voltage input and the power adjust signal.

3. The control circuit of Claim 2 wherein the wavelength controller comprises:

a temperature control circuit that provides a control current to a thermoelectric element for controlling the temperature operation point of the laser diode and having a temperature reference voltage input;

a temperature monitor loop including a temperature sensor for monitoring the temperature operation point to provide a temperature monitor signal;

a wavelength compensation signal added to the temperature monitor signal to provide a wavelength control signal;

wherein the temperature control circuit adjusts the control current to the thermoelectric element responsive to a difference between the temperature reference voltage input and the wavelength control signal.

4. The control circuit of Claim 3 wherein the wavelength compensation signal is proportional to the power control signal.

5. The control circuit of Claim 1 wherein the wavelength controller includes an etalon element.

6. A laser transmitter comprising:

a laser diode;

a modulator for modulating the output of the laser diode; and

a control circuit for controlling the laser diode, the control circuit comprising:

a power controller for adjusting a bias current to the laser diode to change the power output of the laser diode; and

a wavelength controller for compensating for a wavelength shift such that the laser diode maintains operation at the nominal wavelength.

7. The laser transmitter of Claim 6 wherein the power controller comprises:

a bias current source that provides an adjustable bias current to the laser diode and having a power reference voltage input;

a power monitor loop including a backface diode for monitoring the laser diode power output to provide a power monitor signal;

a power control signal added to the power monitor signal to provide a power adjust signal;

wherein the bias current source adjusts the bias current responsive to a difference between the power reference voltage input and the power adjust signal.

8. The laser transmitter of Claim 7 wherein the wavelength controller comprises:

a temperature control circuit that provides a control current to a thermoelectric element for controlling the temperature operation point of the laser diode and having a temperature reference voltage input;

a temperature monitor loop including a temperature sensor for monitoring the temperature operation point to provide a temperature monitor signal;

a wavelength compensation signal added to the temperature monitor signal to provide a wavelength control signal;

wherein the temperature control circuit adjusts the control current to the thermoelectric element responsive to a difference between the temperature reference voltage input and the wavelength control signal.

9. The laser transmitter of Claim 8 wherein the wavelength compensation signal is proportional to the power control signal.

10. The laser transmitter of Claim 6 wherein the wavelength controller includes an etalon element.

11. A method of controlling a laser diode, the method comprising:

adjusting a bias current to the laser diode to change the power output of the laser diode, the power change having a corresponding wavelength shift effect on the nominal operating wavelength of the laser diode;

compensating for the wavelength shift such that the laser diode maintains operation at the nominal wavelength.

12. The method of Claim 11 wherein adjusting comprises:

monitoring the laser diode power output to provide a power monitor signal;

adding a power control signal to the power monitor signal to provide a power adjust signal;

adjusting the bias current responsive to a difference between a power reference voltage signal and the power adjust signal.

13. The method of Claim 12 wherein compensating comprises:

providing a control current to a thermoelectric element for controlling the temperature operation point of the laser diode;

monitoring the temperature operation point to provide a temperature monitor signal;

adding a wavelength compensation signal to the temperature monitor signal to provide a wavelength control signal;

adjusting the control current to the thermoelectric element responsive to a difference between a temperature reference signal and the wavelength control signal.

14. The method of Claim 13 wherein the wavelength compensation signal is proportional to the power control signal.

15. A control circuit for a laser diode, the circuit comprising:

means for adjusting a bias current to the laser diode to change the power output of the laser diode, the power change having a corresponding wavelength shift effect on the nominal operating wavelength of the laser diode;

means for compensating for the wavelength shift such that the laser diode maintains operation at the nominal wavelength.

16. The control circuit of Claim 15 wherein means for adjusting comprises:

a bias current source that provides an adjustable bias current to the laser diode and having a power reference voltage input;

a power monitor loop including a backface diode for monitoring the laser diode power output to provide a power monitor signal;

a power control signal added to the power monitor signal to provide a power adjust signal;

wherein the bias current source adjusts the bias current responsive to a difference between the power reference voltage input and the power adjust signal.

17. The control circuit of Claim 16 wherein means for compensating comprises:

a temperature control circuit that provides a control current to a thermoelectric element for controlling the temperature operation point of the laser diode and having a temperature reference voltage input;

a temperature monitor loop including a temperature sensor for monitoring the temperature operation point to provide a temperature monitor signal;

a wavelength compensation signal added to the temperature monitor signal to provide a wavelength control signal;

wherein the temperature control circuit adjusts the control current to the thermoelectric element responsive to a difference between the temperature reference voltage input and the wavelength control signal.

18. The control circuit of Claim 17 wherein the wavelength compensation signal is proportional to the power control signal.

19. The control circuit of Claim 15 wherein means for compensating includes an etalon element.